IN THE SPECIFICATION:

Please replace the Summary of Invention section on page 3, line 5 through page 5, line 10 with the following amended section:

--A photoelectric conversion device of the present invention has a plurality of photoelectric conversion regions each having a first semiconductor region for accumulating electric charges that correspond to incident light and [[an]] a plurality of amplifying ~~filed~~ field effect transistors into which a signal charge from the photoelectric conversion region is inputted, and is characterized in that:

[[the]] each photoelectric conversion region is surrounded by a potential barrier region;

a nick region is formed in a part of the potential barrier region; and

one of main electrode regions of the field effect transistor is placed adjacent to the nick region, the main electrode region having the same conductivity type as the first semiconductor region ~~photoelectric conversion region~~.

The above-described photoelectric conversion device of the present invention improves the efficiency in collecting carriers (electric charges) generated by surrounding a pixel with a potential barrier and by using, if carriers to be accumulated in the photoelectric conversion region are electrons, a p type impurity or the like to form the potential barrier. In this way, carriers can be prevented from seeping into adjacent pixels and other regions.

In some cases, however, it is required to release carriers to a desired portion once the saturation is reached. For that reason, the potential barrier is partially removed, and a

main electrode region (drain region, for instance) of the field effect transistor is placed in front of the nick in the barrier. At that time, within the range of the proximity effect of potentials, this effect is obtained merely by removing the impurity used to form the barrier. It is also possible to control the height of the barrier by adjusting the width of the gap that is left by the removal.

The barrier may be further lowered by introducing an impurity to the region where the barrier is partially removed. This is achieved by introducing a dopant in a concentration lower than the barrier impurity concentration, or by counter doping of the region in question with a dopant of opposite conductivity type to thereby lower the effective impurity concentration of the region. As a result, excess carriers can steadily flow out to the lateral overflow drain (LOD) when the photodiode nears saturation.

As described above, excess carriers are prevented from flowing into adjacent pixels or other floating diffusion regions when the diode nears saturation by forming the LOD (lateral overflow drain) such that the photoelectric conversion region is surrounded by a potential barrier, a part of the barrier is removed to form a low barrier portion, and a main electrode region (drain region or source region) is placed in front of the low barrier portion. Accordingly, smearing and cross talk can be avoided and thus a photoelectric conversion device having higher sensitivity and less cross talk is obtained.

Another aspect of the present invention includes a photoelectric conversion device including a plurality of photoelectric conversion regions each having a first semiconductor region for accumulating electric charges that correspond to incident light; and a plurality of amplifying field effect transistors into which a signal charge from the photoelectric conversion regions is inputted; and a second semiconductor region connected to a gate of each amplifying

field effect transistor, and is characterized in that:

a potential barrier region surrounds each photoelectric conversion region,

a low potential barrier region is formed in a part of said potential barrier region and has a potential lower than a potential of the other part of said potential barrier region,

a transfer region transfers the signal charges in each of the first semiconductor regions to the second semiconductor regions, and

one of main electrode regions of the field effect transistors is placed adjacent to said low potential barrier region, said main electrode region having the same conductivity type as said first semiconductor region.--